Chapter 2

Description of Proposed Action and Alternatives

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2.1 Introduction

As described in Chapter 1, Glacier Northwest wishes to increase its maximum production rate at Maury Island from roughly 10,000 tons per year (the level of production that has occurred in recent years) to up to 7.5 million tons per year (that is, 5.5 million cubic yards).

The Applicant also wishes to revise and upgrade its existing Surface Mining Reclamation Permit, which was issued by WDNR, in accordance with the 1993 amendments to the state's Surface Mining Act (RCW Chapter 78.44).

This chapter describes the Applicant's proposal in detail, as well as two mining alternatives that would involve reduced hours of barging. The No-Action Alternative is also described. Table 2-1 at the end of this chapter compares the features of the alternatives. Conceptual diagrams of the proposed mine phasing plan, contouring plan, and reclamation plan are illustrated in Figures 2-1 through 2-3, respectively.

2.2 Description of the Proposed Action

2.2.1 Scale of Operation

The operation would last for several decades and would include periods of relatively constant mining and barging, followed by relatively inactive periods. During active periods, barge loading could occur at any time, but is most likely to occur at night (which is the Applicant's stated preference). Because of this, lighting would be required (see Chapter 11).

At maximum production rates, the mine would be exhausted in as little as 11 years. However, such a case is not likely because the

market is not expected to support maximum production at the site over prolonged periods.

The proposed Port of Seattle third runway project is an example of how a single project could influence mining levels and the duration of mining at the site. That project would require a tremendous amount of fill and, should the Maury Island site be used as a source for that fill, the site could operate at the proposed production level of 7.5 million tons for 3 years or more.

Once such a project were completed, however, several years could pass before a similar level of production were needed for a large project or several large projects. While the exact market cannot be predicted, it is unlikely that the market could sustain the 7.5-million ton production level and, therefore, the site is projected to be in production over several decades.

At full production, barging could occur continuously. Under average conditions, a barge would be at the site about half of the time, even at full production This is because the 7.5 million ton annual limit would not allow 24-hour, 7-day a week barge loading to occur continuously for a year. At such a rate, the 7.5 million ton limit could be reached in about 190 days.

As under current practices, operations would also provide materials for the local market (Maury Island and Vashon Island). The amount of sand and gravel extracted for the local market was estimated to average approximately 15,000 tons in 1998 (range of 10,000 to 20,000 tons per year) with an annual increase assumed to be 2.5 percent for this EIS analysis; actual increases would depend on market needs and local growth. This would be delivered via truck, at a rate not to exceed 20 trucks per day. At some point, the increase in extraction for the local market would slow and eventually become steady, since demand for sand and gravel within the confines of Vashon/Maury Island is limited.

2.2.2 Clearing and Ground Preparation

Clearing of the site would be phased with mining activities (Figure 2-1). Clearing would occur in scheduled phases of approximately 32 acres each. No more than two phases, or 64 acres of mining/reclamation activities, would be in process at any one time. However, once mined, lands would take decades to approximate current conditions, so that the entire mining "footprint" would be altered both in topography and vegetation cover. Reclamation, including planting, thinning, and control of

unwanted vegetation, may occur over many years. A conceptual scheme of the contouring plan is given in Figures 2-2A, B, and the Applicant's proposed reclamation plan is shown in Figure 2-3.

To address public safety concerns regarding arsenic contamination of site soils, the Applicant is proposing to fully contain contaminated materials at the site within a sealed berm. No contaminated materials would be removed from the site. At full capacity (when mining is complete), the berm would measure up to 30 feet high and 2,100 feet long. As proposed by the Applicant, the berm would be located on the northern edge of the site (Figure 2-1), but outside of the 50-foot vegetated buffer (described in the next paragraph), which would be maintained. The containment process for soils is described in more detail in Section 2.2.5.

Along the edge of the mining pit, a 50-foot-wide buffer would be retained around the perimeter of the site. About 40 feet of the buffer would be vegetated, and 10 feet would include a fence and related clearing. With the exception of the existing dock area, a 200-foot-wide naturally vegetated buffer would be retained along the Puget Sound shoreline as required by the Shoreline Management Act. No mining or other activity would be permitted within these buffer areas.

Maintenance of the 200-foot shoreline buffer and the 50-foot buffer between the site and neighboring properties would result in approximately 14 percent of the site being retained as designated open space and upland habitat.

2.2.3 Facilities and Equipment

The site contains a relatively uniform product, and, therefore, operations and processing would be relatively simple. Few product specifications would be produced at the site, compared to other sites that produce a wide range of products (e.g., different sizes of gravel, mixtures, etc.) requiring complicated sorting, processing, and mixing and the associated equipment.

The following sections describe facilities and equipment that would be used for the Proposed Action.

2.2.3.1 Structures

A small office would be placed on the site. Other storage and security areas may be established (such as small fenced yards to

protect tools or other valuable items), but no other new permanent structures would be constructed on the site. A portable, self-contained restroom facility and a portable storage container would be located on the site.

The existing dock would require maintenance and repairs, as described in Section 2.2.3.6. Otherwise, under the proposed project the dock would remain as is, with no increase in dimensions. Mitigation measures identified in Chapter 6 (Section 6.4) include replacement and/or extension of the dock into deeper water to avoid nearshore impacts.

2.2.3.2 Access and Roads

Access would remain as is, with the main entrance to the site provided from two private driveways from Southwest 260th Street. No major change in these entrances is proposed. Both roads continue to the dock. Entrances and roads would remain unpaved. Additional haul and access roads would be developed as the site is mined.

2.2.3.3 Heavy Equipment

In most cases, excavators or graders would be used to clear vegetation and soils as new areas are prepared for mining. Sand and gravel would be mined using wheel loaders and bulldozers. Wheel loaders would be used to load materials onto trucks for direct sales on the island and to feed the portable processing plant (crusher and screening facility), when present (see Section 2.2.3.4). The number of loaders and bulldozers needed would be based on market demand, loading rates, size of barges, and type of material. As an estimate for use in this analysis, between one and three loaders and one to four bulldozers would operate at any one time.

Bulldozers would be used to excavate mixed materials. They would work from the top of the slope, pushing materials down to a collection point, where the material would then be placed in a collection feeder, which delivers materials to the conveyer system.

Watering trucks and fuel/lubricant trucks would also be present onsite.

2.2.3.4 Processing Equipment

The project would include portable screens and potentially a portable crushing plant. Depending on product specifications required by customers, screens would be used to separate some of the gravels that are found in the otherwise clean sand. Gravel

would be stockpiled until about 40,000 or 50,000 tons have been collected (which, based on known geologic conditions, would take about 3 to 4 years to accumulate). Once a sufficient amount is present to justify it, a portable crushing plant would be brought to the site. Such a plant takes two people to operate and can crush about 300 tons an hour, so the plant would be at the site for 1 to 2 months every 3 or 4 years.

2.2.3.5 Conveyor and Dock Loading System

For barge-based deliveries, a conveyer belt system would be used to transport materials from the working face of the mine to a barge moored to the dock. The conveyor would be moved about the site to follow mining activities, and would vary in length between 1,200 and 3,400 feet, depending on where mining is taking place. Conveyor width would be from 48 to 54 inches for conveyors from the mine to the barge loading system, and 24 inches for conveyors associated with screening or crushing plants.

Distribution of sand and gravel throughout the barge would be accomplished by moving the barge back and forth using a tug while the material is loaded from the conveyor. To eliminate the potential for spillage of sand and gravel into the water, mitigation for the conveyor system would include a splash pan.

The existing conveyor on the site would be repaired and renovated as needed, and additional conveyors would be constructed, as needed, to reach active mining areas. The portion of the existing conveyor system within the Maury Island shoreline, as defined in RCW 90.58.030(2)(d), would require the following repairs:

- Within the shoreline area, the existing conveyor structures are partially located within a tunnel. The ends of this tunnel would be reopened, and the vegetation that has grown around the conveyor structures would be cleared. In addition, approximately five power poles with power lines would be replaced in the same location (north of the dock, parallel to the shoreline, and adjacent to the existing access road) as when the conveyor system was last used.

- Approximately 175 troughing idlers and 50 return idlers would be reinstalled on the existing metal conveyor framework attached to the dock and the existing shoreland conveyor structures. One motor drive would be reinstalled approximately 50 feet from the seaward end of the dock, and an additional motor drive would be relocated on the shoreland

conveyor structure approximately 75 feet landward from the ordinary high water mark.

- The rubber conveyor belts would be reinstalled by manually threading them onto and around the idlers. The belt would then be vulcanized by a land-based work crew. The belts would be approximately 54 inches wide, and would curve upward at the sides to a height of approximately 1 foot. A curved plastic or metal tray would be fitted underneath the conveyor belt to catch any material spillage.

- A spill or splash pan would be fitted at the end of the dock to catch any spillage while material is directed onto barges. The pan would be approximately 66 inches in width and 2 feet in length, and would be curved upward slightly at the sides.

- The equipment necessary to complete the conveyor work would include:

  – a backhoe to clear existing tunnels where the conveyor structure is located;

  – a work truck with a cutting torch for mechanical work to the idlers;

  – a derrick mounted on a barge to reinstall and set the motor drive; and

  – the basic equipment necessary to replace power poles and string power lines.

- All of the above work could be completed within approximately 15 working days.

2.2.3.6 Dock Repairs

The dock (Figure 2-4) has been damaged by winter storms and other weathering over the past several years. The last repairs, completed about 8 to 10 years ago, included repair and replacement of about 25 pilings in the dolphins and fender pilings. Dolphins are the clusters of freestanding pilings (not attached to the dock) used to guide barges, to prevent barges from hitting the dock, and for barges to tie up to. Fender pilings are those located on the seaward edge of the dock and are used to protect the dock from barges. Some minor repairs were also made to the walkway parallel to the conveyer system.

For the discussion of required repairs, the dock can be divided into three main segments based on structure and function. These segments are (1) the main conveyor trestle; (2) the pier; and (3) the mooring dolphins (Figure 2-4).

The main conveyor trestle is perpendicular to the shoreline and used to support the conveyor system (described in Section 2.2.3.5) from the shoreline to the barge-loading area. The trestle also provides access to the load-out area at the pier by means of a walkway.

The pier segment is perpendicular to the conveyor trestle and parallel to the shoreline and is located in deeper water. It is used to vertically support mechanical equipment for conveyor discharge onto barges and as lateral support for the "docked" barges being loaded.

Vertical support for mechanical equipment is provided by dedicated vertical bearing piling, while lateral loads from docked barges is provided almost entirely by battering pilings, which are driven at a 4:1 angle shorewards to brace against lateral loads. These pilings are further protected and supported by fender pilings, which make actual contact with the docked barges. The pier also provides access for personnel to the loading area.

The mooring dolphins consist of clusters of freestanding pilings (not attached to the dock) "banded" at the top with several wraps of wire rope to form a large, single cantilever pile. These mooring dolphins are used to tie up and secure barges during loading and to protect the pier from potential damage during barge docking.

Several structural engineering reviews of the dock facility have been completed to estimate the number of pilings requiring replacement to make the dock capable of operating as proposed by the Applicant. Symonds Consulting Engineers, Inc. assessed the dock on behalf of King County (Appendix F); Reid Middleton, Inc. assessed the dock on behalf of the Applicant (Appendix G); and Peratrovich, Nottingham & Drage, Inc. assessed the dock on behalf of the Vashon-Maury Island Community Council (Appendix H). Table 2-2 summarizes the results of the structural engineering reviews.

The assessments generally agree on the level of repair required for the conveyor trestle and pier. However, there is disagreement on the number of pilings to be replaced in the fender system and in the mooring dolphins. This disagreement in number of pilings needing

replacement reflects, in part, different suggested design approaches.

The Applicant proposes to replace the minimum number of pilings necessary to safely operate the facility and to use targeted structural augmentation with steel pilings in the mooring dolphins to assure their functionality. The Symonds (King County) assessment and the Peratrovich (Vashon-Maury Island Community Council) assessment suggest a higher level or total replacement of the fendering system and mooring dolphins during the initial repair process because of their current high level of deterioration.

Evaluation of the walkways, guardrails, and other non-load-bearing timbers revealed that substantial replacement would be required to meet safety standards.

The remaining life expectancy of the structural load-bearing pilings not replaced initially is estimated to be between 3 and 10 years, with approximately 25 percent needing replacement every 3 to 5 years. This would require the replacement of about 30 pilings in the main trestle and pier structures and an additional 30 to 40 pilings in the mooring dolphins during each repair event.

Mitigation measures discussed in Chapter 6 (Section 6.4.3.2–6.4.3.4) suggest full replacement of the dock structure and dolphins to avoid repeated disturbance to the nearshore environment. New dock construction alternatives also would allow the facility to extend further from the shoreline to reduce and minimize disturbance to the shoreline associated with mining and loading operations, such as shading to eelgrass, propwash, material spillage, and noise and vibration.

Replacement of existing pilings would require a pile driver, which is a floating, barge-like vessel mounted with a frame and motorized driver. The vessel would measure about 60 feet wide by 120 feet long and would be fitted with a crane (also called a derrick). To accomplish the work, the pilot would position the derrick vessel centrally using a series of anchors (two to four, depending on conditions). The vessel would then be moved about the work site using electric winches that work up and down the anchor lines. Timber piles would be driven using an air hammer (probably Vulcan number 1) powered by a 600-cubic-foot-per-minute air compressor.

The necessary repairs are expected to take from 2 to 4 weeks to complete. If more substantial initial repairs or full replacement of

the dock facility is undertaken this process would take up to several months.

2.2.3.7 Signs and Lighting

Warning and traffic signs would be posted around the perimeter of the mining area to inform people of restricted access and potential hazards.

Outdoor and security lights would be shielded with top-clad plates and focused downward to avoid glare onto surrounding areas. Strobe lights are proposed to be used on the back of heavy equipment instead of audible alarms to reduce noise during nighttime operations.

2.2.4 Progression of Mining

The proposed mining activities would start in the central and southern portions of the site, and the northern portion of the site would be the last area mined (see Figures 2-1 and 2-2).

Mining would proceed in a continual "leading edge," with the area in front of the leading edge being cleared, the edge itself being mined, and the area behind the leading edge being reclaimed. These three active portions of the mining operation would collectively take up between 32 and 64 acres at any one time.

2.2.5 Containment Procedures for Contaminated Soils

The Applicant proposes to contain contaminated soils in a lined and covered containment cell located on the north side of the property. No contaminated materials would be removed from the site.

Over the course of mining at the site, about 271,000 cubic yards of materials containing arsenic above residential cleanup levels (as defined under the MTCA Method A) would be excavated and contained. Of this total volume, approximately 50,520 cubic yards would contain arsenic concentrations that are also above industrial cleanup levels (again, using MTCA Method A). Soils containing arsenic concentrations above industrial cleanup levels would be managed in a separate phase of the cell that contains thicker or otherwise bolstered covers and linings.

The containment cell would be built along the north side of the property in phases. At full capacity (when mining is complete), the berm would measure up to 30 feet high and 2,100 feet long. The berm would have clean soil placed on top of it, and it would be vegetated. As recommended in Chapter 5, native vegetation would be preferable. Construction of the berm would proceed north to south.

While a bottom liner would not be required (per WAC 173-304-461), a liner and cover would be installed in the containment cell. The Applicant is proposing to install a geosynthetic clay liner (GCL). GCLs are made with a layer of refined clay, which serves as a barrier to water (permeabilities range from 1×10^{-8} to 1×10^{-9} centimeters per second). This clay is bound between layers of geotextile. A GCL is considered equivalent to 2 to 4 feet of clay (with a permeability of 1×10^{-7} centimeters per second).

The clay in GCLs would swell as it is exposed to water and this swelling action closes possible openings in the liner.

To protect the GCL liner from damage during installation and construction, a layer of bedding sand 6 inches thick would be placed over the subgrade to protect the liner from puncture by the gravelly soil. The bedding sand would be screened to remove all material larger than 0.5-inch diameter. The GCL would be covered with a 6-inch layer of drain sand (drain sand should consist of material finer than 0.5-inch diameter with less than 3 percent of grains smaller than the U.S. No. 200 sieve [0.003 inch]).

To address public concerns about water that may accumulate in the cell, a 6-inch diameter perforated pipe would be installed along the downslope side of the cell. This drain would lead to a collection point on one end of the cell. The purposes of this drain are to prevent build-up of water over the liner and to provide a sampling location. A 2-inch diameter perforated pipe would be installed in the bedding sand (under the liner) along the north side. This would also lead to a collection point on one end of the cell and could be used to monitor water under the liner.

Contaminated materials collected during site preparation would be placed over the drain sand. The soil would be placed in horizontal layers and compacted to 90 percent density. The purpose of placement and compaction is to provide a stable slope and firm support for the final cover.

Trees and brush would be removed from contaminated areas prior to excavation of contaminated soil. The trees and brush would not be placed into the containment cell (since their decay would generate water). Contaminated soil would contain some natural organic materials such as roots and vegetation, but not sufficient amounts to generate significant water.

The cover would provide the same barrier to infiltration as the liner. The Applicant proposes a single-layer synthetic membrane or GCL for the cover. The base for the membrane would be screened soil (finer than 0.5-inch diameter). A flexible membrane would be suitable for the cover because a cover is less susceptible to physical damage than the liner. The flexible membrane would be covered with a geotextile fabric to protect it from damage. The cover would be covered with a 6-inch layer of screened drain sand or synthetic drain layer, the same as used over the liner.

The drain layer would be covered with 18 inches of soil, then the surface would be vegetated. Topsoil would not be required as long as the cover soil had sufficient nutrients to support a healthy vegetation cover. The vegetation is needed to prevent surface erosion and for aesthetics.

The containment cell would be constructed in steps to match the mine operation. The first step would start at the downslope end to collect rainwater infiltration and potential leachate. The first step is expected to take soil from Phase 1 and 2 of the mine operation (or about 46,000 cubic yards of contaminated soil). During soil placement, temporary berms would be constructed upslope to divert rainfall runoff from entering the cells. Some rainfall runoff would seep into the sand drain layer over the GCL during soil placement. This water would drain into the perforated pipe at the downslope side.

Any water collected from the berm would be tested and handled according to procedures outlined in the MTCA.

2.2.6 Trucking and Barging

On-island trucking and use of material would stay about the same as current conditions, with trucking activity increasing at an assumed rate of 2.5 percent per year (actual increases would be based on market needs and growth). Due to limits of on-island development, trucking would not increase indefinitely. The increase in on-island deliveries would eventually halt and become relatively stable. This EIS assumes a maximum of 20 truck trips

per day. Any more trips would be considered a major project modification requiring additional SEPA review.

At maximum mining production, about 40,000 tons of material would be barged off the site each day. The most common barge size would be a 10,000-ton capacity, but smaller barges may be used in some cases. At this maximum production rate, barges could be loaded almost continuously. At lower production rates, barge loading could occur at any time of day but is most likely to occur at night, since customers tend to like the product delivered in the morning.

2.2.7 Hours of Operation

The Proposed Action is to have no timing restrictions on barge loading so that the Applicant can serve customers' needs for morning shipments as needed. Other activities would be restricted to general operating hours of 6 a.m. to 10 p.m. Monday through Friday, and 9 a.m. to 6 p.m. on Saturdays.

2.2.8 Employment

Operations would require 2 to 20 people working two shifts for excavation and three shifts for barge loading. The actual number of people employed onsite would depend on what activities are happening and the volume of material shipped per day. Each person working onsite would be involved in mining, reclamation, and barge loading; it is not possible to specify the number of people working on any particular aspect of the operation.

2.2.9 Reclamation

Reclamation would involve (1) slope stabilization and (2) the gradual development of vegetation over mined areas. The WDNR, rather than King County, oversees restoration efforts for mining at the Maury Island site, as it does state-wide under the authority of surface mining regulations (RCW 78.44). These regulations define reclamation as

… rehabilitation for the appropriate future use of disturbed areas resulting from surface mining including areas under associated mineral processing equipment and areas under stockpiled materials. Although both the need for and the practicability of reclamation will control the type and degree of reclamation in any

specific surface mine, the basic objective shall be to reestablish on a perpetual basis the vegetative cover, soil stability, and water conditions appropriate to the approved subsequent use of the surface mine and to prevent or mitigate future environmental degradation (RCW 78.44.031[11]).

Because the subsequent use of the site is unknown, this EIS assumes that the site would remain undeveloped, with reclaimed areas left to grow into forest and grassland communities (as established in the reclamation plan defined by the WDNR). King County may consider a rezone for the property should the owner or others present a proposal for future use other than mining. For this subsequent use, this EIS assumes the appropriate long-term vegetative cover would be native plant communities that are maturing toward the current condition of vegetation onsite. In some cases, nonnative grasses and other plants would need to be planted to prevent erosion.

Since the Proposed Action is still at the planning and environmental review stages, restoration plans are still conceptual. This is a fairly standard procedure, since this allows the WDNR and the Applicant to remain flexible in determining what specifically needs to be done to meet state requirements.

Reclamation would follow WDNR guidelines in Best Management Practices for Reclaiming Surface Mines in Washington and Oregon (Open File Report 96-2). Specific restoration plans would be developed during the latter phase of each mining stage, according to specifications stipulated by the DNR.

Consistent with the WDNR requirements, site reclamation for the Proposed Action would be accomplished in the following four steps: (1) site preparation; (2) slope stabilization and erosion control, including stormwater control and temporary erosion control measures such as hydroseeding and filter fence check dams; (3) final contouring and topsoil placement; and (4) revegetation with grasses, shrubs, and trees (see Figure 2-3). These steps are described below.

2.2.9.1 Site Preparation

In most cases, vegetation would first be cleared and then soils would be scraped using an excavator or grader. Contaminated soils would be collected and placed within the containment cell located at the northern portion of the property.

2.2.9.2 Slope Stabilization

Active slopes and slopes that have been disturbed but are not yet ready for final reclamation would be protected using Best Management Practices. In general, concerns over slope stability of the active mining phase are minor, since the whole purpose of the operation is to bring the material down. Slides are more of a concern for worker safety, and the operators take care to avoid major slides.

Temporary slope stabilization measures, including hydroseeding, filter fencing, and recontouring, would be employed as necessary to minimize erosion. Where appropriate, exposed slopes would be track-walked (up and down) to roughen the ground surface and reduce runoff velocities.

2.2.9.3 Final Contouring and Topsoil Placement

Once an area is mined and ready for permanent reclamation, slopes would be regraded to gradients less than 2 feet horizontal to 1 foot vertical, except where steeper slopes are necessary to match the existing topography. A minimum of 5-foot wide horizontal benches would be placed in the finished cut slopes for every 20 feet of vertical relief to reduce surface water runoff. The 5-foot wide benches would be back-sloped slightly into the hillside and laterally sloped to encourage gravity flow.

Because most existing topsoils would be unavailable for reclamation, either soils manufactured onsite, offsite soils, or a combination of these two would be used for reclamation. Onsite topsoils would be prepared using composted and/or mulched organic matter (from cleared vegetation) added to non-contaminated soils and/or sands. Additional soils would be brought in as necessary to assure that reclamation performance standards are met. Reclamation performance would be monitored by the WDNR, under its statutory jurisdiction over mining reclamation within the State of Washington.

Reclaimed slopes would be hydroseeded and covered with a minimum of 1.5 tons per acre of straw mulch (tacked down) or equivalent on exposed ground surfaces. The type of seeds used would be determined at the time of seeding. No noxious weeds would be included in the seed mix. Seeding would be planted prior to September in order to have the grass established by October. Hydroseeding would probably be completed by contractors, with specifications detailed in the contract.

Specifications would be developed in cooperation with the WDNR under its reclamation authority.

2.2.9.4 Revegetation

Mined areas would be revegetated with various shrubs and trees according to the specifics outlined in the WDNR phase reclamation plan. Woody debris from active mine stages would be placed in reclamation areas to provide wildlife habitat.

2.3 Alternative 1- Reduced Barging Hours, Scenario 1

Alternative 1 differs from the Proposed Action in that barge loading would be restricted to 16 hours each weekday and 9 hours on Saturday (Monday – Friday 6 a.m. to 10 p.m., Saturday 9 a.m. to 6 p.m.). This alternative was developed by the EIS Team in response to public comments and is intended to allow the Applicant, the public, and decision-makers at King County to compare the environmental impacts of the Proposed Action to this hypothetical scenario of reduced hours for barge loading.

The following sections describe how other features of the mining operation under Alternative 1 compare to those of the Proposed Action (see Table 2-1).

2.3.1 Scale of Operation

Under Alternative 1, sand and gravel extraction could be up to 5.72 million tons per year. Most of the material would be sent to off-island markets via barge. The mine would not likely operate at this level of production all the time. As for the Proposed Action, operations would slow when demand for the product is low, and operations may even stop for periods of time.

At full production, the site deposits could be mined in 15 years. At less than full production, operations could last longer. For this EIS, it is assumed that the site would operate for up to 40 years.

If mining occurred at the maximum possible rate and barge loading were to occur 16 hours each weekday and 9 hours on Saturdays, as proposed for Alternative 1, 5.72 million tons of material could be excavated annually. If mining were to proceed at a slower rate, the annual volume excavated would be less than 5.72 million tons. Actual operations would most likely vary from the maximum

possible, but as for the Proposed Action, environmental impacts of this alternative are addressed at full production rates rather than at average rates.

As under current conditions (and as for the Proposed Action), the mine would also provide materials for the local market (Maury Island and Vashon Island). The amount of materials extracted for the local market would average 15,000 tons annually with an annual increase assumed to be 2.5 percent (actual increases would depend on market needs). Because demand for sand and gravel for the local market is limited, the growth in extractions for the local market would slow and eventually stabilize.

2.3.2 Clearing and Ground Preparation

Clearing and ground preparation activities for Alternative 1 would be the same as for the Proposed Action.

2.3.3 Facilities and Equipment

Alternative 1 would require the same facilities and equipment as the Proposed Action.

2.3.4 Progression of Mining

The progression of mining operations for Alternative 1 would be the same as for the Proposed Action, but mining would progress at a slower rate.

2.3.5 Containment Procedures for Contaminated Soils

Contaminated soils would be placed in a containment cell as described for the Proposed Action.

2.3.6 Trucking and Barging

As for the Proposed Action, trucking would remain the same as current conditions; it is assumed that trucking activity would increase at 2.5 percent per year (actual increases would depend on market demands), with a maximum of 20 truckloads daily.

At maximum mining production, about 20,000 tons of material would be barged off the site each weekday and about 10,000 tons would be barged on Saturday. The most common barge size would be 10,000 tons, but smaller barges would also be used.

2.3.7 Hours of Operation

Under Alternative 1, mining and barging activities would occur only from 6 a.m. to 10 p.m. Monday through Friday and from 9 a.m. to 6 p.m. on Saturdays.

2.3.8 Employment

Operations under Alternative 1 would require 2 to 18 people working two shifts for excavation and barge loading. The actual number of people onsite would depend on the activities occurring and the volume of material being shipped each day. As for the Proposed Action, it is not possible to specify the number of people working on any particular activity.

2.3.9 Reclamation

Reclamation requirements and activities for Alternative 1 would be the same as for the Proposed Action.

2.4 Alternative 2 - Reduced Barging Hours, Scenario 2

Under Alternative 2, barge loading would be restricted to 12 hours each weekday and on Saturday (Monday - Saturday 7 a.m. to 7 p.m.). As with Alternative 1, Alternative 2 would reduce the ability of the Applicant to provide sand and gravel products on demand, and, therefore, does not meet the project objectives as well as the Proposed Action.

The following sections describe how other features of the mining operation compare to those of the Proposed Action (see Table 2-1).

2.4.1 Scale of Operation

Under Alternative 2, sand and gravel extraction could be up to 3.12 million tons per year. Most of the material would be sent to off-island markets via barge. The mine would not likely operate at

this level of production all the time. As for the Proposed Action, operations would slow when demand for the product is low, and operations may even stop for periods of time.

At full production, the site deposits could be mined in 30 years. At less than full production, operations could last longer. For this EIS, it is assumed that the site could be operating for up to 50 years.

If mining occurred at the maximum possible rate and barge loading were to occur 12 hours each weekday and on Saturdays, as proposed for Alternative 2, 3.12 million tons of material could be excavated annually. If mining were to proceed at a slower rate, the annual volume excavated would be less than 3.12 million tons. Actual operations would most likely vary from the maximum possible, but as for the Proposed Action, environmental impacts of this alternative are addressed at full production rates, rather than at average rates.

As under current conditions (and as for the Proposed Action), the mine would provide materials for the local market (Maury Island and Vashon Island). The amount of materials extracted for the local market would average 15,000 tons annually with an annual increase assumed to be 2.5 percent (actual increases would depend on market needs). Because demand for sand and gravel for the local market is limited, growth in extractions for the local market would slow and eventually stabilize.

2.4.2 Clearing and Ground Preparation

Clearing and ground preparation activities for Alternative 2 would be the same as for the Proposed Action.

2.4.3 Facilities and Equipment

Alternative 2 would require the same facilities and equipment as the Proposed Action.

2.4.4 Progression of Mining

The progression of mining operations for Alternative 2 would be the same as for the Proposed Action, but mining would progress at a slower rate.

2.4.5 Containment Procedures for Contaminated Soils

Contaminated soils would be placed in a containment cell as described for the Proposed Action.

2.4.6 Trucking and Barging

Trucking would remain the same as current conditions; it is assumed that trucking activity would increase at 2.5 percent per year (actual increases would depend on market demands), with a maximum of 20 truckloads daily.

At maximum mining production, about 10,000 tons of material would be barged off the site each weekday and on Saturday. The most common barge size would be 10,000 tons, but smaller barges may be used in some cases.

2.4.7 Hours of Operation

Under Alternative 2, active mining would occur only from 7 a.m. to 7 p.m. Monday through Friday and from 9 a.m. to 6 p.m. on Saturdays. Barging would occur from 7 a.m. to 7 p.m. Monday through Saturday.

2.4.8 Employment

Operations under Alternative 2 would require 2 to 12 people working one shift for excavation and barge loading. The actual number of people onsite would depend on the activities occurring and the volume of material being shipped each day. As for the Proposed Action, it is not possible to specify the number of people working on any particular activity.

2.4.9 Reclamation

Reclamation requirements and activities for Alternative 2 would be the same as for the Proposed Action.

2.5 No-Action Alternative

2.5.1 No-Action Alternatives under SEPA

Under SEPA, King County must evaluate the "No-Action Alternative", which is defined by the state SEPA Handbook as "what would be most likely to happen if the proposal did not occur".

In some cases, No-Action can mean little or no impact, such as when bare land is proposed for a major facility, and not implementing the proposal maintains the bare land condition. In other cases, however, such as for a needed new roadway, No-Action could result in increased traffic congestion, reduced safety, and serious reduction in service levels as the unmet need for a new road increases over time. In other cases, particularly those involving a change in land use or rezone, No-Action means that the proposal does not occur but the site would be fully developed anyway under existing zoning.

Because the SEPA rules do not define what the No-Action Alternative must entail, King County has some discretion in its formulation. The Applicant already has a permit to extract sand from the site up to roughly 50 feet from the property boundaries (200 feet from the shoreline). For the purpose of comparative analysis and to understand the environmental effects of the Applicant's proposal, this EIS considers the No-Action Alternative as the status quo, or essentially how the mine has operated on average over the past 20 years.

No-Action, then, assumes that relatively low mining levels would occur indefinitely. The most significant differences under No-Action are the absence of barging, no use of a conveyor system, and no large-scale extraction.

The features of the No-Action Alternative are summarized and compared to the Proposed Action in Table 2-1 and discussed below.

2.5.2 Facilities and Operation

Under the No-Action Alternative, the existing permit would remain as is and extraction would be maintained at an average of 15,000 tons per year (ranging from 10,000 to 20,000 tons per year). Under this development alternative, only local markets on

the island would be served. At this rate of extraction, the mine would remain in operation indefinitely.

The site currently contains a dock, conveyor system, and an "open face" of the mine covering approximately 40 acres. The existing dock, which is approximately 1,300 feet in length and 50 feet wide, was constructed in 1968 by Lone Star Industries (parent company to Glacier Northwest). Although the dock has been maintained and repaired over the years, there is no record of any barge-loading activity over the past 20 years.

Operating hours would remain as currently set: from 7 a.m. to 7 p.m., Monday through Friday, and 9 a.m. to 6 p.m. on Saturdays. Employment would likely be less than five staff; two shifts are possible but unlikely.

Mining under No-Action would proceed very slowly, could continue indefinitely, and would include the following elements:

- Extraction – Gravel extraction would use equipment similar to that discussed under the Proposed Action. The major difference is that the conveyor belt to the dock would not be used. Crushing activities onsite would be sporadic as would most extraction activities.

- Sorting and Washing – The screening plant would be used to sort and crush the rock but at much lower levels. No other processing is envisioned.

- Materials Stockpiling – Stockpiling would occur at a much lower rate than the Proposed Action and at a rate similar to existing conditions.

- Water Supply and Wastewater Management – As with the Proposed Action, none would be required. Water for dust control would be trucked into the site.

- Water Collection/Treatment – Stormwater collection would remain minimal because very little of the site surface would be exposed at any one time. At the current level of extraction, it is likely that stormwater runoff would not increase from the current rate. A new stormwater pond would not be needed.

2.5.3 Containment Procedures for Contaminated Soils

Under No-Action, a much lower volume of soils would require management due to the low level of mining. The method for addressing contaminated soils would be agreed to between the Department of Ecology/King County and the Applicant.

2.5.4 Trucking and Barging

Truck activities under the No-Action Alternative are assumed to be identical to the Proposed Action because truck delivery has been the principal activity over the last 20 years. Truck activity would average less than 5 trucks per day, over a 6-day week, with up to 20 trucks per day each way (40 trips). The rate of truck activity would increase the same as discussed for the Proposed Action (assumed annual 2.5 percent increase with an eventual leveling off to relatively constant levels).

No barging would occur under the No-Action Alternative.

2.5.5 Reclamation

The same reclamation plan described for the Proposed Action would also apply for No-Action, as required by WDNR in the 1971 Surface Mining Reclamation Permit (No. 70-010256), as revised under the 1993 amendments to the Surface Mining Act. The rate of extraction and restoration would be entirely different than the Proposed Action. In some cases, natural revegetation is likely to occur at a faster rate than planned revegetation because of the low rate of extraction.

It is difficult to predict the exact progression of mining since under the No-Action Alternative it could take thousands of years to completely mine the site. While it is conceivable that contours may eventually reach that of the Proposed Action, this EIS assumes that a much smaller area would be affected within the predictable future. For generations to come, there would be little or no terracing. Slopes would revegetate at a rate exceeding that of new exposure. Restoration would occur to meet the requirements of the existing permit. Seeding would be done as needed but on smaller areas than for the Proposed Action.

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Table 2-1. Comparison of Features among Alternatives

Component	*No-Action Alternative*	*Proposed Action*	*Alternative 1*	*Alternative 2*	*Proposed Action with all Additional Mitigation (including restricted hours)*
SCALE OF OPERATION					
Area to be Mined	Ultimately, 193 acres, but much smaller area within the foreseeable future	193 acres	Same as Proposed Action	Same as Proposed Action	174 acres
Estimated Maximum Annual Extraction	20,000 tons	7.5 million tons*	5.72 million tons*	3.12 million tons*	3.12 million tons*
Duration of Project	Mining to occur indefinitely	Between 11 and 50 years. Assumed to be 35 years for analysis in the EIS	Between 15 and 60 years. Assumed to be 40 years for analysis in the EIS	Between 30 and 75 years. Assumed to be 50 years for analysis in the EIS	Between 25 and 70 years
Local Market Sales	Local market sales would average 15,000 tons annually (range 10,000 to 20,000 tons per year) of sand and gravel, with an annual assumed increase of 2.5%	Same as No-Action	Same as No-Action	Same as No-Action	Same as No-Action
Trucking	Average hauling less than 5 trucks/day, over a 6-day week, assumed to increase at 2.5% annually, with a maximum of 20 trucks/day each way (40 one-way trips)	Same as No-Action	Same as No-Action	Same as No-Action	Same as No-Action
Hours of Active Mining	Current hours of mining: M-F 7 a.m. – 7 p.m. Sat 9 a.m. – 6 p.m. Maintenance could occur at any time	M-F 6 a.m. – 10 p.m. Sat 9 a.m. – 6 p.m. Maintenance could occur at any time	M-F 6 a.m. – 10 p.m. Sat 9 a.m. – 6 p.m. Maintenance could occur at any time	M-F 7 a.m. – 7 p.m. Sat 9 a.m. – 6 p.m. Maintenance could occur at any time	M-F 7 a.m. – 7 p.m. Sat 9 a.m. – 6 p.m. Maintenance could occur at any time

Table 2-1. Continued

Component	*No-Action Alternative*	*Proposed Action*	*Alternative 1*	*Alternative 2*	*Proposed Action with all Additional Mitigation (including restricted hours)*
Hours Barge Loading would be Allowed	None	No restrictions	16 hours per weekday, 9 hours on Saturday: M-F 6 a.m. – 10 p.m. Sat 9 a.m. – 6 p.m.	12 hours per day, M-Sat 7 a.m. – 7 p.m.	12 hours per day, M-Sat 7 a.m. – 7 p.m.
Barging	None	Maximum of four 10,000-ton barges loaded in each 24-hour period (or a greater number of smaller barges)	Maximum of two 10,000-ton barges loaded in each weekday and one on Saturday (or a greater number of smaller barges)	Maximum of one 10,000-ton barge loaded in each working day (or a greater number of smaller barges)	Maximum of one 10,000-ton barge loaded in each working day (or a greater number of smaller barges)
Employment	5 staff or fewer would operate the site	2 to 20 staff would operate the site at any one time, with two shifts for mining and three shifts for barge loading	2 to 18 staff would operate the site at any one time, with two shifts for mining and for barge loading	2 to 12 staff would operate the site at any one time, with one shift for mining and for barge loading	2 to 12 staff would operate the site at any one time, with one shift for mining and for barge loading
Clearing and Ground Preparation	Conducted in slow progression from the central portion of the site out	Phased clearing, with two areas up to 32 acres being cleared and prepared for mining at any one time. Up to 64 acres of land being mined or actively reclaimed at any one time	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
FACILITIES AND EQUIPMENT					
Structures	None	Small office, storage and security areas, and portable restroom. Repairs to dock structure	Same as Proposed Action	Same as Proposed Action	Old dock replaced with extended, state-of-the-art facility
Access and Roads	Use existing	Same as No-Action, but additional access roads constructed as mining progresses	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action

Table 2-1. Continued

Component	*No-Action Alternative*	*Proposed Action*	*Alternative 1*	*Alternative 2*	*Proposed Action with all Additional Mitigation (including restricted hours)*
Heavy Equipment	Wheel loaders used to load trucks	Combination of bulldozers and wheel loaders used for barge-based projects	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Processing Equipment	Portable screening plant as needed (expected onsite for about 1 month every 5 to 10 years)	Portable crushing and screening plant as needed (expected onsite for 1 to 2 months once every 3 to 4 years)	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Conveyance Equipment	Material loaded onto trucks for on-island deliveries	Truck loading for on-island deliveries. Material for off-island deliveries would be transported from mined areas to barges using a conveyer belt system, ranging in length from 1,200 to 3,400 feet	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
RECLAMATION	Low levels of mining would require little reclamation. Most reclamation done in small patches to minimal standards (as required by WDNR permit). Little or no terracing for several decades	Active mining/reclamation confined to 64 acres at one time, up to two 32-acre phases. Reclamation would follow WDNR guidelines and may include use of native plants and habitat features for wildlife. Topsoil would be manufactured onsite and augmented with offsite materials as necessary to meet WDNR reclamation standards	Same as Proposed Action	Same as Proposed Action	Major emphasis on restoring madrone forest

Table 2-1. Continued

Component	*No-Action Alternative*	*Proposed Action*	*Alternative 1*	*Alternative 2*	*Proposed Action with all Additional Mitigation (including restricted hours)*
BUFFERS					
Adjacent Property Buffers	50-foot vegetated buffers around perimeter of site	Same as No-Action	Same as No-Action	Same as No-Action	Same as No-Action
Shoreline Buffer	200-foot shoreline buffer from ordinary high water mark of Puget Sound	Same as No-Action	Same as No-Action	Same as No-Action	Same as No-Action, also restore shoreline habitat
Stormwater Management	No stormwater pond constructed	A new stormwater pond would be constructed	Same as Proposed Action	Same as Proposed Action	Dispersed stormwater system, rather than centralized pond
*numbers approximate					

Table 2-2. Estimated Repairs Needed for Dock

Structure	*Pile Type*[1]	*Estimated Number of Piles to be Replaced*			
		Total Number of Existing Piles	*Symonds*	*Reid Middleton*	*Peratrovich*
Conveyor trestle	vertical	26	4	6	6
Pier	bearing	32	7	10	10
	battering	20 (18)	5	10	10
Fender system	fender	24 (21)	10	10	21 (all)
Total		**102 (97)**	**26**	**36**	**47**
Dolphins	cluster	190 (105)	90	18[2]	105 (all)
Grand Total		**292 (202)**	**116**	**54**[2]	**152**

[1] Total number of existing pilings differed between the Symonds (King County) assessment and the Reid Middleton (Applicant) and Peratrovich (Maury-Vashon Island Community Council) assessments. The number in parenthesis indicates the existing pilings according to the Reid Middleton assessment and the Peratrovich assessment.

[2] The number of dolphin pilings to be replaced, suggested by the Applicant, reflects adding 6 steel dolphins (3 piles per dolphin, total 18) to supplement the existing dolphins. The existing dolphin pilings could be removed or left in place because the functional capacity would be provided by the new steel dolphins.